CLAIMS

What is claimed is:

1. A method of preserving a nucleic acid in a bodily fluid, comprising the steps of:
   a) providing a nucleic acid preservative solution comprising
      i) an amount of a divalent metal chelator selected from the group consisting of ethylenediaminetetraacetic acid (EDTA), [ethylenebis(oxyethylenenitrilo)]tetraacetic acid (EGTA) and 1,2-bis(2-aminophenoxy)ethane-N,N,N',N'-tetraacetic acid (BAPTA), or salts thereof in the range of from about 0.001M to 0.1M; and
      ii) an amount of at least one chelator enhancing component selected from the group consisting of lithium chloride, guanidine, sodium salicylate, sodium perchlorate and sodium thiocyanate in the range of from about 0.1M to 2M; and
   b) adding said nucleic acid preservative to said bodily fluid.

2. The method of claim 1 wherein said nucleic acid preservative is an aqueous solution comprising said divalent metal chelator and said chelator enhancing component.

3. The method of claim 1 wherein said chelator enhancing component is selected from the group consisting of sodium perchlorate, sodium thiocyanate, and lithium chloride.

4. The method of claim 1 wherein said chelator enhancing component is present in an amount of about 1M.

5. The method of claim 1 wherein said divalent metal chelator is present in an amount of at least about 0.01M.

6. The method of claim 1 wherein said nucleic acid preservative further comprises an amount of at least one enzyme inactivating component selected from the group consisting of manganese chloride, sarkosyl, and sodium dodecyl sulfate in the range of about 0-5% molar concentration.

7. The method of claim 1 wherein said nucleic acid is selected from the group consisting of DNA, RNA, mRNA, and cDNA.

8. The method of claim 7 wherein said DNA is eukaryotic DNA.

9. A nucleic acid preservative solution comprising:
   a) an amount of a divalent metal chelator selected from the group consisting of ethylenediaminetetraacetic acid (EDTA), [ethylenebis(oxyethylenenitrilo)]tetraacetic acid (EGTA) and 1,2-bis(2-

aminophenoxy)ethane-N,N,N',N'-tetraacetic acid (BAPTA), or salts thereof in the range of from about 0.001M to 0.1M; and

b) an amount of at least one chelator enhancing component selected from the group consisting of lithium chloride, guanidine, sodium salicylate, sodium perchlorate, and sodium thiocyanate in the range of from about 0.1M to 2M.

10. The nucleic acid preservative of claim 9 wherein said nucleic acid preservative is an aqueous solution comprising said divalent metal chelator and said chelator enhancing component.

11. The nucleic acid preservative of claim 9 wherein said chelator enhancing component is present in an amount of about 1M.

12. The nucleic acid preservative of claim 9 wherein said divalent metal chelator is present in an amount of about 0.01M.

13. The nucleic acid preservative of claim 9 wherein further comprising an amount of at least one enzyme inactivating component selected from the group consisting of manganese chloride, sarkosyl, and sodium dodecyl sulfate in the range of about 0-5% molar concentration.

14. A preserved nucleic acid-containing fluid comprising:

a) an amount of a divalent metal chelator selected from the group consisting of ethylenediaminetetraacetic acid (EDTA), [ethylenebis(oxyethylenenitrilo)]tetraacetic acid (EGTA) and 1,2-bis(2-aminophenoxy)ethane-N,N,N',N'-tetraacetic acid (BAPTA), or salts thereof in the range of from about 0.001M to 0.1M; and

b) an amount of at least one chelator enhancing component selected from the group consisting of lithium chloride, guanidine, sodium salicylate, sodium perchlorate, and sodium thiocyanate in the range of from about 0.1M to 2M.

15. A method of improving the signal response of a molecular assay of a test sample, comprising the steps of:

a) providing a nucleic acid preservative solution comprising

i) an amount of a divalent metal chelator selected from the group consisting of ethylenediaminetetraacetic acid (EDTA), [ethylenebis(oxyethylenenitrilo)]tetraacetic acid (EGTA) and 1,2-bis(2-aminophenoxy)ethane-N,N,N',N'-tetraacetic acid (BAPTA), or salts thereof in the range of from about 0.001M to 0.1M; and

ii) an amount of at least one chelator enhancing component selected from the group consisting of lithium chloride, guanidine, sodium salicylate,

sodium perchlorate, and sodium thiocyanate in the range of from about 0.1M to 2M;

b) adding said nucleic acid preservative to a test sample to provide a preserved test sample;

c) extracting molecular analytes of interest from said preserved test sample; and

d) conducting a molecular assay on said extracted molecular analytes of interest.

16. The method of claim 15 wherein said test sample is a bodily fluid.

17. The method of claim 16 wherein said bodily fluid is selected from the group consisting of urine, blood, blood serum, amniotic fluid, salivary fluid, vaginal fluid, conjunctival fluid, stool, seminal fluid, and sweat.

18. The method of claim 17 wherein said nucleic acid is selected from the group consisting of DNA, RNA, mRNA, and cDNA.

19. The method of claim 18 wherein said DNA is eukaryotic DNA.

20. The method of claim 15 wherein said molecular assay is selected from the group consisting of the polymerase chain reaction, ligase chain technology test, and a genetic transformation test.

21. A method of improving hybridization of nucleic acids, comprising the steps of:

a) contacting a test nucleic acid with a nucleic acid preservative solution comprising

i) an amount of a divalent metal chelator selected from the group consisting of ethylenediaminetetraacetic acid (EDTA), [ethylenebis(oxyethylenenitrilo)]tetraacetic acid (EGTA) and 1,2-bis(2-aminophenoxy)ethane-N,N,N',N'-tetraacetic acid (BAPTA), or salts thereof in the range of from about 0.001M to 0.1M; and

ii) an amount of at least one chelator enhancing component selected from the group consisting of lithium chloride, guanidine, sodium salicylate, sodium perchlorate, and sodium thiocyanate in the range of from about 0.1M to 2M, such that a test solution is formed;

b) contacting said test solution with a target nucleic acid under conditions favorable for hybridization, such that hybridization occurs.